

WHAT IS CLAIMED IS:

1 1. A method in a computer system for maintaining and digitally signing
2 a unique authoritative electronic record, the method comprising the steps of:
3 receiving an original electronic record in a repository;
4 generating at least some first receipt information, wherein the first
5 receipt information includes information relating to the original electronic record;
6 prepending the first receipt information at a beginning portion of the
7 original electronic record;
8 generating at least some first identifying information, wherein the
9 first identifying information includes a provable representation of the first receipt
10 information;
11 appending the first identifying information at an end portion of the
12 original electronic record;
13 storing the original electronic record with the prepended first receipt
14 information and the appended first identifying information in the repository as an
15 authoritative electronic record;
16 receiving a request to review and optionally sign the authoritative
17 electronic record at a remote location;
18 computing a partial message digest of a proper subset of the
19 authoritative electronic record;
20 computing a complement of the proper subset of the authoritative
21 electronic record;
22 transmitting the partial message digest of the authoritative electronic
23 record to the remote location;
24 transmitting the complement of the proper subset of the authoritative
25 electronic record to the remote location;
26 computing a message digest, at the remote location, using the partial
27 message digest and the complement of the proper subset of the authoritative
28 electronic record;
29 displaying the complement of the proper subset of the authoritative
30 electronic record at the remote location;
31 allowing a digital signature to be computed at the remote location
32 using the computed message digest and a private key;

33 returning the digital signature to the repository;
34 receiving the digital signature in the repository;
35 generating at least some second receipt information, wherein the
36 second receipt information includes information relating to the signed authoritative
37 electronic record;
38 prepending the second receipt information at a beginning portion of
39 the signed authoritative electronic record;
40 generating at least some second identifying information, wherein the
41 second identifying information includes a provable representation of the receipt
42 information;
43 appending the second identifying information at an end portion of the
44 signed authoritative electronic record;
45 determining whether the digital signature information represents a
46 valid digital signature; and
47 amending, if the digital signature information is determined to
48 represent a valid digital signature, the authoritative electronic record in the
49 repository to include the digital signature information, the prepended second receipt
50 information, and the appended second identifying information from the signed
51 authoritative electronic record.

1 2. The method of claim 1, wherein the step of receiving an original
2 electronic record further comprises the step of adding time-stamp information to the
3 original electronic record, wherein the time-stamp information comprises the time
4 and the date when the original electronic record is received in the repository.

1 3. The method of claim 1, wherein the digital signature information is
2 created with the use of the message digest and a private key.

1 4. The method of claim 1, wherein the first receipt information includes
2 at least some digital signature information that is generated using a private key of
3 the repository.

1 5. The method of claim 1, wherein the proper subset of the authoritative
2 electronic record comprises information prepended to beginning portion of the
3 authoritative electronic record.

1 6. The method of claim 1, wherein the complement of the proper subset
2 of the authoritative electronic record comprises the original electronic record and
3 information appended to the end portion of the original electronic record.

1 7. The method of claim 1, wherein the steps of transmitting the partial
2 message digest of the authoritative electronic record and transmitting the
3 complement of the proper subset of the authoritative electronic record to the remote
4 location include transmitting the partial message digest and transmitting the
5 complement of the proper subset of the authoritative electronic record to the remote
6 location in a single transmission.

1 8. The method of claim 1, wherein at least one software program
2 associated with the repository is utilized at the remote location.

1 9. The method of claim 1, wherein the partial message digest includes
2 information necessary to compute the message digest at the remote location.

1 10. The method of claim 1, wherein the step of prepending the second
2 receipt information at a beginning portion of the signed authoritative electronic
3 record includes replacing the first receipt information with the second receipt
4 information.

1 11. The method of claim 1, wherein the second receipt information
2 includes at least some digital signature information that is generated using a private
3 key of the repository.

1 12. The method of claim 1, wherein the second identifying information is
2 generated using at least some repository information.

1 13. The method of claim 1, wherein the second identifying information is
2 generated using at least some user information.

1 14. The method of claim 1, wherein the second identifying information is
2 generated using at least some remote location information.

1 15. The method of claim 1, wherein the step of appending the second
2 identifying information at an end portion of the signed authoritative electronic
3 record includes amending the first identifying information to include the second
4 identifying information.

1 16. A method in a computer system for maintaining and digitally signing
2 a unique authoritative electronic record, the method comprising the steps of:
3 providing for the receipt of an original electronic record in a
4 repository;
5 providing for the generation of at least some first receipt information,
6 wherein the first receipt information includes information relating to the original
7 electronic record;

8 providing for the prepending of the first receipt information at a
9 beginning portion of the original electronic record;
10 providing for the generation of at least some first identifying
11 information, wherein the first identifying information includes a provable
12 representation of the first receipt information;
13 providing for the appending of the first identifying information at an
14 end portion of the original electronic record;
15 providing for the storage of the original electronic record with the
16 prepended first receipt information and the appended first identifying information in
17 the repository as an authoritative electronic record;
18 providing for the receipt of a request to review and optionally sign
19 the authoritative electronic record at a remote location;
20 providing for the computation of a partial message digest of a proper
21 subset of the authoritative electronic record;
22 providing for the computation of a complement of the proper subset
23 of the authoritative electronic record;
24 providing for the transmission of the partial message digest and the
25 complement of the proper subset of the authoritative electronic record to the remote
26 location;
27 providing for the computation of a message digest, at the remote
28 location, using the partial message digest and the complement of the proper subset
29 of the authoritative electronic record;
30 providing for the display of the complement of the proper subset of
31 the authoritative electronic record at the remote location;
32 providing for at least some digital signature information to be
33 generated at the remote location using the computed message digest and a private
34 key;
35 providing for the receipt of the digital signature information in the
36 repository;
37 providing for the generation of at least some second receipt
38 information, wherein the second receipt information includes information relating to
39 the signed authoritative electronic record;
40 providing for the prepending of the second receipt information at a
41 beginning portion of the signed authoritative electronic record;

42 providing for the generation of at least some second identifying
43 information, wherein the second identifying information includes a provable
44 representation of the receipt information;
45 providing for the appending of the second identifying information at
46 an end portion of the signed authoritative electronic record;
47 providing for the determination of whether the digital signature
48 information represents a valid digital signature; and
49 providing for the amending, if the digital signature information is
50 determined to represent a valid digital signature, of the authoritative electronic
51 record in the repository to include the digital signature information, the prepended
52 second receipt information, and the appended second identifying information from
53 the signed authoritative electronic record.

1 17. A method for creating an authoritative electronic record in a
2 repository, the method comprising the steps of:
3 receiving an original electronic record in a repository;
4 generating at least some first receipt information, wherein the first
5 receipt information includes information relating to the original electronic record;
6 prepending the first receipt information at a beginning portion of the
7 original electronic record;
8 generating at least some first identifying information, wherein the
9 first identifying information includes a provable representation of the first receipt
10 information;
11 appending the first identifying information at an end portion of the
12 original electronic record; and
13 storing the original electronic record with the prepended first receipt
14 information and the appended first identifying information in the repository as an
15 authoritative electronic record.

1 18. The method of claim 17, wherein the step of receiving an original
2 electronic record further comprises the step of adding time-stamp information to the
3 original electronic record, wherein the time-stamp information comprises the time
4 and the date when the original electronic record is received in the repository.

1 19. The method of claim 17, wherein the digital signature information is
2 created with the use of the message digest and a private key.

1 20. The method of claim 17, wherein the first receipt information
2 includes at least some digital signature information that is generated using a private
3 key of the repository.

1 21. A method for storing an original electronic record as an authoritative
2 electronic record in a repository, the method comprising the steps of:

3 transmitting an original electronic record to a repository;

4 allowing at least some first receipt information to be generated,

5 wherein the first receipt information includes information relating to the original
6 electronic record;

7 allowing the first receipt information to be prepended at a beginning
8 portion of the original electronic record;

9 allowing at least some first identifying information to be generated,

10 wherein the first identifying information includes a provable representation of the
11 first receipt information;

12 allowing the first identifying information to be appended at an end
13 portion of the original electronic record; and

14 allowing the original electronic record to be stored with the
15 prepended first receipt information and the appended first identifying information in
16 the repository as an authoritative electronic record.

1 22. A method for displaying a provable representation of an authoritative
2 electronic record at a remote location, the method comprising the steps of:

3 receiving a request to review and optionally sign an authoritative
4 electronic record stored in a repository, at a remote location, wherein the
5 authoritative electronic record includes at least some first receipt information
6 prepended at a beginning portion of the authoritative electronic record, and at least
7 some first identifying information, appended at an end portion of the original
8 electronic record, wherein the first identifying information includes a provable
9 representation of the first receipt information;

10 computing a partial message digest of a proper subset of the
11 authoritative electronic record;

12 computing a complement of the proper subset of the authoritative
13 electronic record;

14 transmitting the partial message digest of the authoritative electronic
15 record to the remote location;

transmitting the complement of the proper subset of the authoritative electronic record to the remote location;

allowing a message digest to be computed, at the remote location, using the partial message digest and the complement of the proper subset of the authoritative electronic record; and

allowing the complement of the proper subset of the authoritative electronic record to be displayed at the remote location, wherein the complement of the proper subset of the authoritative electronic record is a provable representation of the authoritative electronic record.

23. The method of claim 22, wherein the proper subset of the authoritative electronic record comprises information prepended to beginning portion of the authoritative electronic record.

24. The method of claim 22, wherein the complement of the proper subset of the authoritative electronic record comprises the original electronic record and information appended to the end portion of the original electronic record.

25. The method of claim 22, wherein the steps of transmitting the partial message digest of the authoritative electronic record and transmitting the complement of the proper subset of the authoritative electronic record to the remote location include transmitting the partial message digest and transmitting the complement of the proper subset of the authoritative electronic record to the remote location in a single transmission.

26. The method of claim 22, wherein the complement of the proper subset of the authoritative electronic record includes a complement of the proper subset of the authoritative electronic record and all information appended to the end portion of the authoritative electronic record.

27. The method of claim 22, wherein the digital signature information is produced using a private key.

28. The method of claim 22, wherein at least one software program associated with the repository is utilized at the remote location.

29. The method of claim 22, further comprising the step of allowing at least the digital signature information to be returned to the repository.

30. A method for generating a digital signature at a remote location and transmitting the digital signature to a repository, the method comprising the steps of:

3 receiving a complement of the proper subset of the authoritative
4 electronic record from a repository;
5 receiving a partial message digest of the authoritative electronic
6 record from a repository;
7 computing a message digest of the authoritative electronic record
8 using the complement of the proper subset of the authoritative electronic record and
9 the partial message digest of the authoritative electronic record;
10 allowing a private key to be used to generate at least some digital
11 signature information; and
12 transmitting the digital signature information to the repository.

1 31. A method for including a valid digital signature in an authoritative
2 electronic record stored in a repository, wherein the authoritative electronic record
3 includes at least some first receipt information prepended at a beginning portion of
4 the authoritative electronic record, and at least some first identifying information
5 appended at an end portion of the authoritative electronic record, wherein the first
6 identifying information includes a provable representation of the first receipt
7 information, the method comprising the steps of:

8 receiving at least some digital signature information, wherein the
9 digital signature information was generated using a private key and a message
10 digest, wherein the message digest is computed using a partial message digest of the
11 authoritative electronic record and a complement of a proper subset of the
12 authoritative electronic record;

13 determining whether the digital signature information represents a
14 valid digital signature; and

15 amending, if the digital signature information is determined to
16 represent a valid digital signature, the authoritative electronic record to create a
17 signed authoritative electronic record, wherein the signed authoritative electronic
18 record comprises the authoritative electronic record and the digital signature
19 information.

1 32. The method of claim 31, wherein the step of amending, if the digital
2 signature information is determined to represent a valid digital signature, a signed
3 authoritative electronic record includes the steps of:

4 prepending digital signature information comprising a digital
5 signature to the beginning portion of the authoritative electronic record; and

6 appending digital signature information comprising a provable
7 representation of the digital signature information to the end portion of the
8 authoritative electronic record.

1 33. The method of claim 31, wherein the step of amending, if the digital
2 signature information is determined to represent a valid digital signature, a signed
3 authoritative electronic record includes the steps of:

4 prepending at least some signature receipt information to the
5 beginning portion of the authoritative electronic record, wherein the signature
6 receipt information comprises a unique representation of the signed authoritative
7 electronic record; and

8 appending at least some identifying information to the end portion of
9 the authoritative electronic record, wherein the identifying information comprises a
10 provable representation of the signature receipt.

1 34. The method of claim 31, further including the steps of:

2 receiving a request, from a remote location, to review and optionally
3 sign the signed authoritative electronic record, wherein the signed authoritative
4 electronic record includes validated digital signature information;

5 computing a partial message digest of a proper subset of the signed
6 authoritative electronic record;

7 computing a complement of the proper subset of the signed
8 authoritative electronic record;

9 transmitting the partial message digest of the signed authoritative
10 electronic record to the remote location;

11 transmitting the complement of the proper subset of the signed
12 authoritative electronic record to the remote location;

13 allowing a message digest to be computed, at the remote location,
14 using the partial message digest and the complement of the proper subset of the
15 signed authoritative electronic record;

16 allowing the complement of the proper subset of the signed
17 authoritative electronic record to be displayed at the remote location;

18 receiving at least some new digital signature information, wherein the
19 new digital signature information was generated using a private key and the
20 computed message digest;

determining whether the new digital signature information represents a valid digital signature; and

amending, if the new digital signature information is determined to represent a valid digital signature, the signed authoritative electronic record to include the new digital signature information.

35. The method of claim 34, wherein the partial message digest includes information necessary to compute the message digest at the remote location.

36. A computer system for maintaining and updating a unique authoritative electronic record, the system comprising:

means for receiving an original electronic record;

means for generating at least some first receipt information, wherein the first receipt information includes information relating to the original electronic record;

means for prepending the first receipt information at a beginning portion of the original electronic record;

means for generating at least some first identifying information, wherein the first identifying information includes a provable representation of the first receipt information;

means for appending the first identifying information at an end portion of the original electronic record;

means for storing the original electronic record with the prepended first receipt information and the appended first identifying information in the repository as an authoritative electronic record;

means for receiving a request to review and optionally sign the authoritative electronic record at a remote location;

means for computing a partial message digest of a proper subset of the authoritative electronic record;

means for computing a complement of the proper subset of the authoritative electronic record;

means for transmitting the partial message digest and the complement of the proper subset of the authoritative electronic record to the remote location;

means for computing a message digest, at the remote location, using the partial message digest and the complement of the proper subset of the authoritative electronic record;

28 means for displaying the complement of the proper subset of the
29 authoritative electronic record at the remote location;
30 means for allowing at least some digital signature information to be
31 generated at the remote location, wherein the digital signature information is
32 generated using the computed message digest and a private key;
33 means for receiving the digital signature information in the
34 repository;
35 means for generating at least some second receipt information,
36 wherein the second receipt information includes information relating to the signed
37 authoritative electronic record;
38 means for prepending the second receipt information at a beginning
39 portion of the signed authoritative electronic record;
40 means for generating at least some second identifying information,
41 wherein the second identifying information includes a provable representation of the
42 receipt information;
43 means for appending the second identifying information at an end
44 portion of the signed authoritative electronic record;
45 means for determining whether the digital signature information
46 represents a valid digital signature; and
47 means for amending, if the digital signature information is
48 determined to represent a valid digital signature, the authoritative electronic record
49 in the repository to include the digital signature information, the prepended second
50 receipt information, and the appended second identifying information from the
51 signed authoritative electronic record.

1 37. A system for creating an authoritative electronic record in a
2 repository, the system comprising:
3 a software program that is capable of receiving an original electronic
4 record;
5 a software program that is capable of generating at least some first
6 receipt information, wherein the first receipt information includes information
7 relating to the original electronic record;
8 a software program that is capable of prepending the first receipt
9 information at a beginning portion of the original electronic record;
10 a software program that is capable of generating at least some first

11 identifying information, wherein the first identifying information includes a
12 provable representation of the first receipt information;
13 a software program that is capable of appending the first identifying
14 information at an end portion of the original electronic record; and
15 a software program that is capable of storing the original electronic
16 record with the prepended first receipt information and the appended first identifying
17 information in the repository as an authoritative electronic record.

1 38. A system for obtaining a digital signature on an authoritative
2 electronic record stored in a repository, the system comprising:

3 a software program that is capable of receiving a request to review
4 and optionally sign an authoritative electronic record, stored in a repository, at a
5 remote location, wherein the authoritative electronic record includes at least some
6 first receipt information prepended at a beginning portion of the authoritative
7 electronic record, and at least some first identifying information, appended at an end
8 portion of the authoritative electronic record, wherein the first identifying
9 information includes a provable representation of the first receipt information;

10 a software program that is capable of computing a partial message
11 digest of a proper subset of the authoritative electronic record;

12 a software program that is capable of computing a complement of the
13 proper subset of the authoritative electronic record;

14 a software program that is capable of controlling the transmission of
15 the complement of the proper subset of the authoritative electronic record, the partial
16 message digest and the complement of the proper subset of the authoritative
17 electronic record to the remote location;

18 a software program that is capable of allowing a message digest to be
19 computed, at the remote location, using the partial message digest and the
20 complement of the proper subset of the authoritative electronic record;

21 a software program that is capable of allowing the complement of the
22 proper subset of the authoritative electronic record to be displayed at the remote
23 location; and

24 a software program that is capable of allowing at least some digital
25 signature information to be generated using the computed message digest and a
26 private key.

1 39. A system for including a valid digital signature in an authoritative
2 electronic record stored in a repository, wherein the authoritative electronic record
3 includes at least some first receipt information prepended at a beginning portion of
4 the authoritative electronic record, and at least some first identifying information
5 appended at an end portion of the authoritative electronic record, wherein the first
6 identifying information includes a provable representation of the first receipt
7 information, the system comprising:

8 a software program that is capable of receiving at least some digital
9 signature information produced using a computed message digest and a private key,
10 wherein the computed message digest is generated using a partial message digest of
11 the authoritative electronic record and a complement of a proper subset of the
12 authoritative electronic record;

13 a software program that is capable of determining whether the digital
14 signature information represents a valid digital signature;

15 a software program that is capable of amending, if the digital
16 signature information is determined to represent a valid digital signature, the
17 authoritative electronic record to create a signed authoritative electronic record,
18 wherein the signed authoritative electronic record includes the authoritative
19 electronic record and the digital signature information; and

20 a software program that is capable of storing the signed authoritative
21 electronic record in the repository as the authoritative electronic record.

1 40. A computer program product for obtaining a digital signature on a
2 single authoritative copy of an original electronic record comprising:

3 a computer usable medium and computer readable code embodied on
4 the computer usable medium for obtaining a digital signature on a single
5 authoritative copy of an original electronic record, the computer readable code
6 comprising:

7 computer readable program code devices configured to cause the
8 computer to effect the storing of an original electronic record as an authoritative
9 electronic record in a repository;

10 computer readable program code devices configured to cause the
11 computer to effect the transmission of a provable representation of an authoritative
12 electronic record from a repository to a remote location, wherein the provable
13 representation of the authoritative electronic record includes a partial message digest

14 of the authoritative electronic record and a complement of a proper subset of the
15 authoritative electronic record;
16 computer readable program code devices configured to cause the
17 computer to effect the generation of at least some digital signature information,
18 wherein the digital signature information is produced using a computed message
19 digest and a private key, wherein the computed message digest is generated using
20 the partial message digest of the authoritative electronic record and the complement
21 of a proper subset of the authoritative electronic record;
22 computer readable program code devices configured to cause the
23 computer to effect the transmission of the digital signature information from the
24 remote location to the repository and the receipt of the digital signature information
25 in the repository;
26 computer readable program code devices configured to cause the
27 computer to effect the amending, if the received digital signature information is
28 determined to be valid, of the authoritative electronic record in the repository to
29 include at least some of the received digital signature information.